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THE POLYTECHNIC
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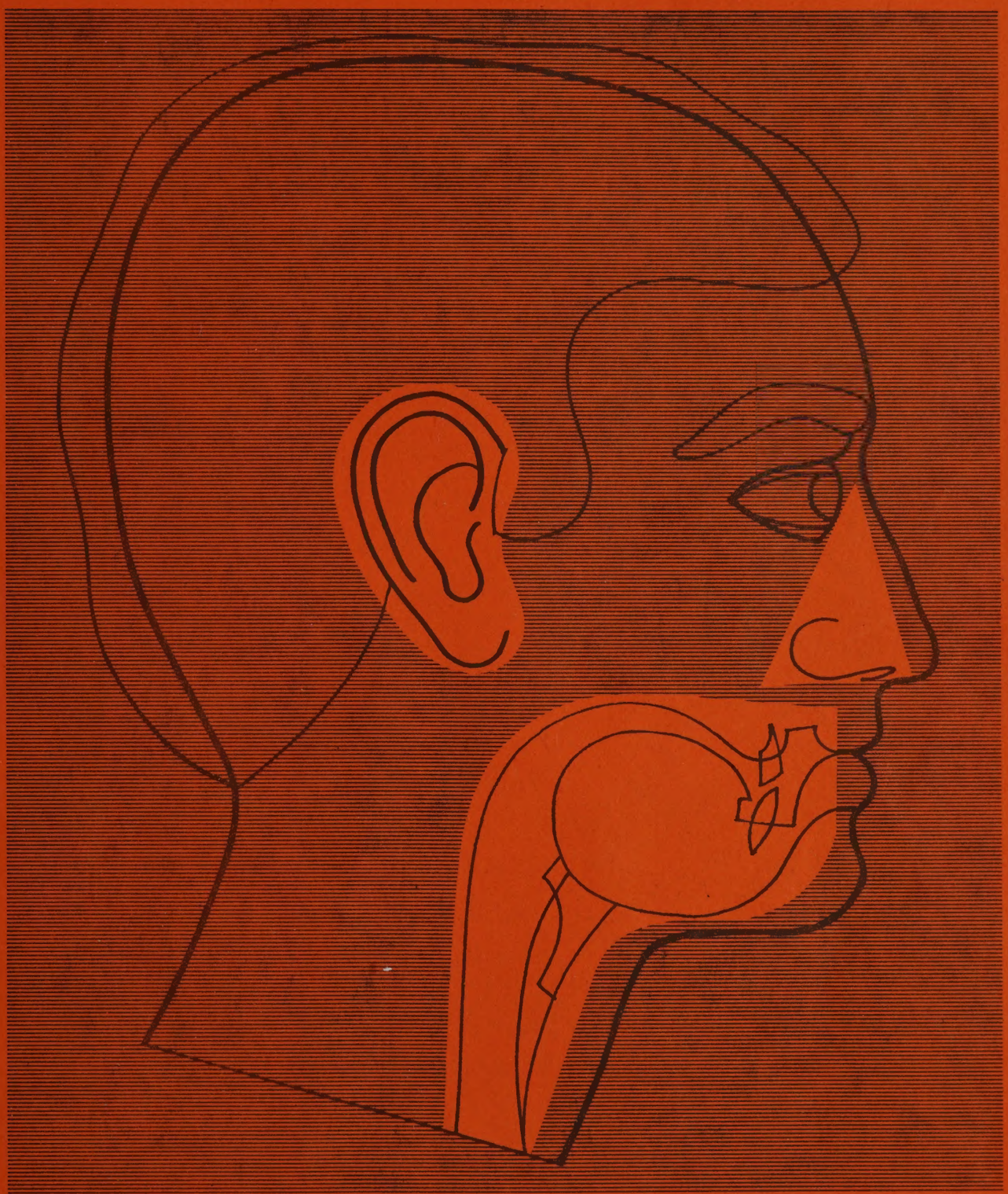
HOSPITAL E.N.T. SERVICES
A DESIGN GUIDE



DEPARTMENT OF HEALTH AND SOCIAL SECURITY
FEBRUARY 1974

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A DESIGN GUIDE

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DEPARTMENT OF HEALTH AND SOCIAL SECURITY

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I. Scope

1. This document contains guidance on the design and planning of the facilities required for an E.N.T. department at a district general hospital and includes information about the requirements of an associated hearing aid centre.

2. The organisation and the nature of E.N.T. services and those for the deaf are likely to change in future years and this guidance should therefore be regarded as interim; the planning of E.N.T. departments should take account of the possible need for adaptation and further expansion of accommodation needs.

II. General considerations

3. The functions of an E.N.T. department are (a) to diagnose and treat diseases and disorders of the ear, nose and throat and (b) to act as the hospital focus for the assessment and treatment of deafness at all ages. The first function requires both in-patient and out-patient accommodation, the second mainly out-patient accommodation.

4. The number of in-patient beds required for any given population is comparatively small (about 12 beds per 100,000) and they are therefore best concentrated in units large enough to justify the employment of sufficient numbers of consultants and other medical, nursing and technical staff to maintain an efficient service throughout the year. It is desirable that there should be not less than two consultants on the staff of hospitals where in-patient treatment is given and, where such concentration would not involve patients and relatives in undue travelling, the aim should be larger units employing three or more consultants. In-patient services are, therefore, best provided only at selected district general hospitals.

5. E.N.T. out-patient services and services for the deaf (diagnosis, assessment of disability, treatment and the dispensing of a hearing aid where necessary) will normally be required at every district general

hospital and when new hospitals are being planned the aim should be to combine these functions in the same building. This Design Guide gives an indication of the type of provision which should be made.

6. Close links should be established between the hospital service and the community health, social and educational services so that the deaf of all ages can benefit from a team approach to their problems when this is thought to be necessary.

7. The facilities provided for deaf children at the district general hospital will need to be supplemented at selected hospitals by a specialised advisory service concerned especially with disorders of speech and hearing in children. This highly specialised service should be planned in association with the hospital facilities needed for the comprehensive assessment of mentally and physically handicapped children and should preferably be located in a teaching hospital or a large urban district general hospital actively engaged in research into problems of hearing and speech. Guidance on the planning of such centres is not given in this document.

III. General planning considerations

IN-PATIENTS

8. At hospitals where in-patient treatment is to be given the provision indicated below should be included:

(a) An adequate number of beds for both adults and children. The provision suggested is up to 12 beds per 100,000 of the population in the proportion of about two-thirds for adults and one-third for children. As regards the children's element, general guidance on hospital facilities for children is given in HM(71)22. As these children's beds will be used mainly for surgical treatment of tonsils and adenoids, length of stay will tend to be short. An important need is to ensure close post-operative supervision and control by E.N.T. staff. Where this can be arranged in the children's department the children's E.N.T. beds should be so located. If the E.N.T. section of the children's department can be planned immediately

adjacent to the adult E.N.T. beds in order to achieve the closest possible co-operative working, this would be a great advantage but it is recognised that planning considerations may make this impossible.

(b) An adequate allocation of operating sessions in the hospital operating department.
As a guide to the number of weekly operating sessions needed, it is suggested that three operating sessions per week should be allotted per 100,000 of the population.

(c) Access to the general supporting services of a district general hospital.
These would include the radiology and pathology services and the facilities for staff training and post-graduate medical education.

OUT-PATIENTS

9. The E.N.T. accommodation should be planned as a part of the main out-patient department of the hospital so that as much use as possible can be made of that department's basic facilities. There should be access to day beds to which patients undergoing day surgery can be admitted for pre-operative preparation and post-operative recovery.

10. Operating facilities may be in minor theatres or treatment rooms in the out-patient department, or use may be made of the main operating department for certain patients from the day ward, if this is suitably situated.

11. Day care for children should wherever possible be provided within the day care facilities of the children's department. In some hospitals the children's out-patient case-load may be sufficient to justify the provision of a special children's section within the out-patient department but in any case it is usual to provide a children's waiting/play room, with associated amenities for mother and child and to organize special children's sessions in appropriate specialties.

12. E.N.T. out-patient accommodation includes a number of rooms in which low noise levels are required such as audiology rooms and, to a lesser degree, interview/fitting rooms in the hearing aid centre. The accommodation as a whole should be sited with this general requirement in mind and the internal planning should ensure that these noise-sensitive areas are sited

away from obvious sources of noise such as lift shafts, ventilation ducts, lavatories, plant rooms, intensively used corridors, external roads and car parks. Particular care should be taken to avoid the transmission of noise from above and below such areas.

13. Some rooms may house sensitive recording apparatus which is susceptible to electrical interference and they should be sited to avoid this. Possible sources of interference include lift shafts, lift motor rooms, transformer rooms and some equipment in the rehabilitation and operating departments.

14. Many existing and most future sites are likely to be subject to increasing noise from aircraft, road traffic and other extraneous sources. The low noise levels required in audiology rooms will only be achieved therefore either in internal core situations or in perimeter rooms with sealed windows which are double-glazed or even in some circumstances triple-glazed and of the correct sound-attenuating design for each particular circumstance. In either case mechanical ventilation with winter heating and summer cooling will be required.

15. Well established principles of sound insulation should be employed in the design of the audiology rooms and the advice of a specialist in acoustics should be sought at an early stage. The ambient sound level in these rooms should not exceed 30 dB(A) and the reverberation time should not exceed 0.25 seconds.

16. Interview/fitting rooms in the hearing aid centre and the speech therapy room need a less exacting acoustic environment, 40 dB(A) being an acceptable standard. Thus in some cases it should be possible, again by careful siting, to meet these requirements in rooms with an external wall and a window with normal glazing and without artificial ventilation. This standard would also be acceptable in the observation areas overlooking the audiology rooms.

IV. Outpatient accommodation requirements

GENERAL

17. The E.N.T. out-patient unit at district general hospitals should consist of the following functional elements:

E.N.T. clinic
audiology suite
hearing aid centre
office and other supporting accommodation.

A suggested functional relationship is shown in Figure 1. This is a department where wheelchairs may be used extensively and, where appropriate, doors should be sized accordingly.

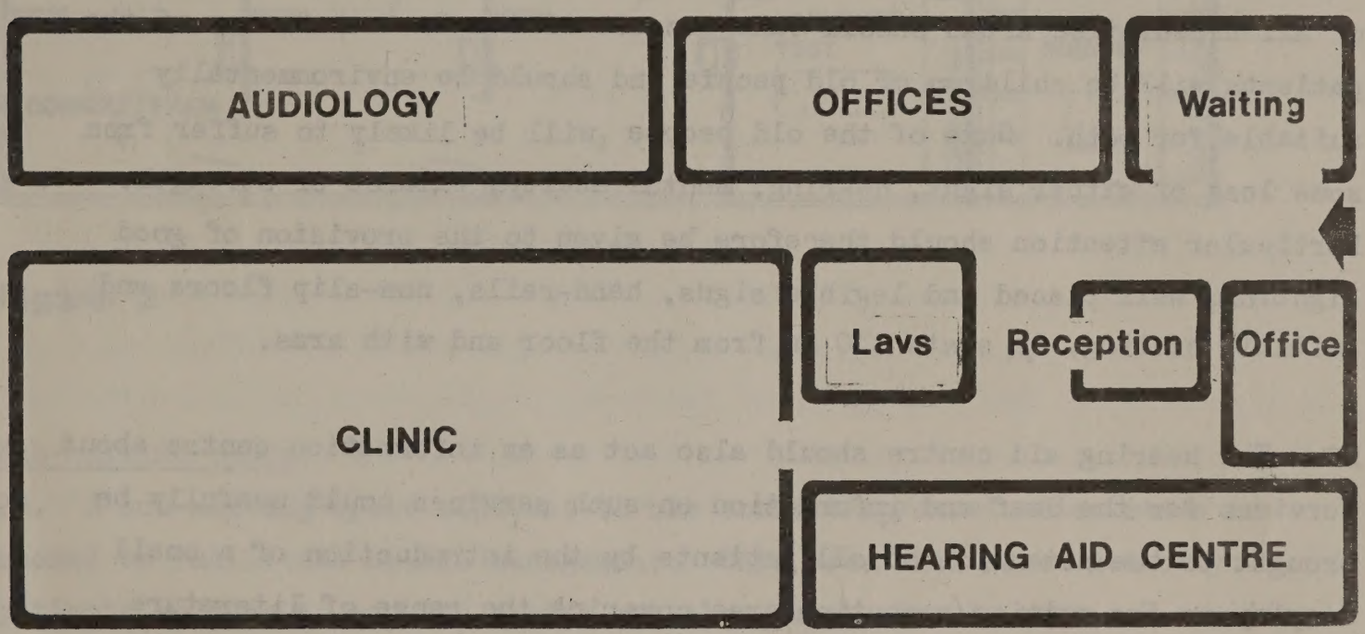


Figure 1

Entrance and reception

18. The entrance to the unit should be adjacent to or should be shared with that of the main out-patient department. It should lead directly to the unit reception area serving patients who will be attending clinics in any of the functional elements indicated in the previous paragraph. Some of the patients will have to communicate name, address, age and family particulars in writing and the design of the reception desk or counter

should enable this to be done whilst the patient, whether ambulant or in a wheelchair, is seated. Other patients will need very loud spoken communication and if possible they should be given extra privacy, perhaps by being able to use the general office for documentation purposes. There should be sufficient flat surfaces to enable the documentation of those patients attending an E.N.T. clinic session and some clerical tasks to be carried out. The reception area should be adjacent to a general office which will serve mainly the hearing aid centre. It would be an advantage for the receptionist to have a view into the E.N.T. clinic sub-waiting area.

Main waiting

19. A single waiting space, naturally lit wherever possible and with ready access to lavatories, should be provided for patients attending either the E.N.T. clinic or the hearing aid centre. The design of the space and that of all circulation areas should take account of the fact that many of the patients will be children or old people and should be environmentally suitable for both. Some of the old people will be likely to suffer from some loss of either sight, hearing, mental acuity, balance or strength. Particular attention should therefore be given to the provision of good lighting, well placed and legible signs, hand-rails, non-slip floors and suitable seating, i.e. seats 430 mm from the floor and with arms.

20. The hearing aid centre should also act as an information centre about services for the deaf and information on such services could usefully be brought to the attention of all patients by the introduction of a small display in the waiting/reception area covering the range of literature available about deafness.

Patients' lavatories

21. Separate male and female lavatories should be provided, with an additional large WC compartment opening directly from a circulation space for the use of a wheelchair patient of either sex. Appendix 1 shows a suitable arrangement for a wheelchair compartment.

E.N.T. CLINIC

22. Since patients are not normally required to undress and therefore turnover is relatively rapid, the tempo of work in an E.N.T. clinic differs from that in most other out-patient clinics and the planning and design should take this into account. A plan form is recommended which will enable a member of staff to regulate the movement of patients between the sub-

waiting space, consulting/examination rooms and the treatment area. Figure 2 illustrates a suitable layout and if possible the whole department should be planned to ensure that this suite will not be used as a short cut to other elements in the department.

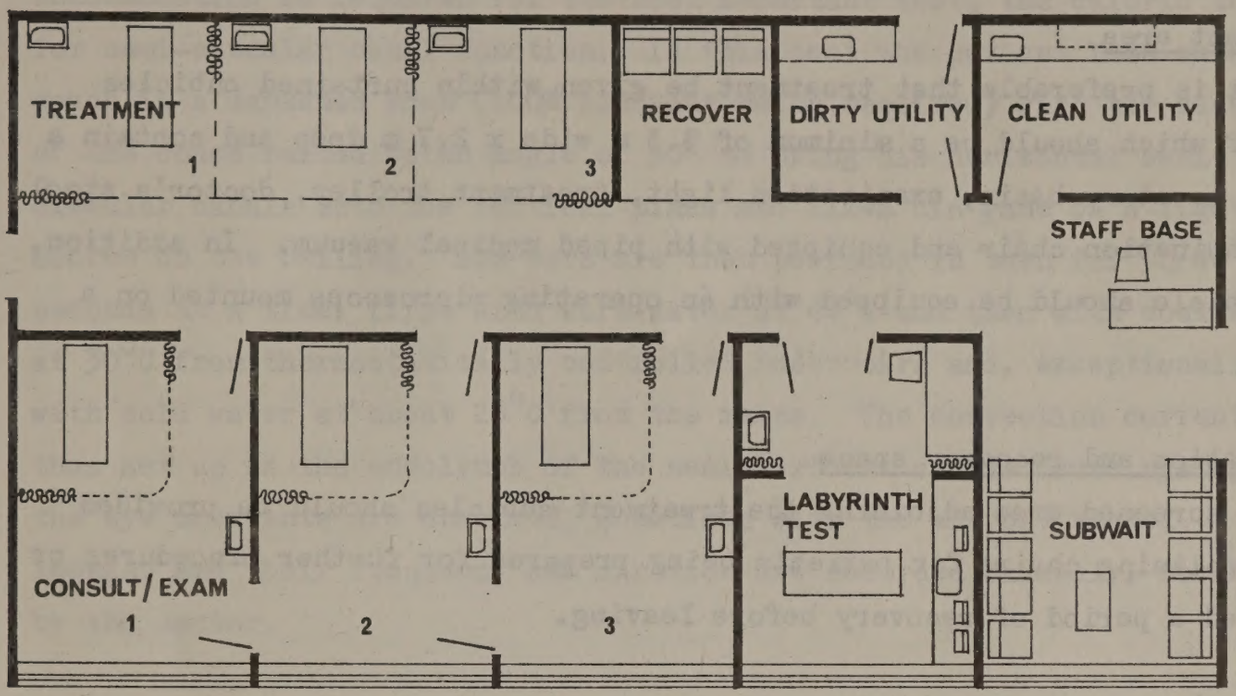


Figure 2

Sub-waiting space

23. A sub-waiting space adjacent to the consulting/examination rooms is needed to facilitate clinic management. This area will serve not only patients waiting to see the doctor but also those already seen and awaiting further attention, those returning from, say, audiometry or X-ray and occasionally those returning for routine treatment who do not need to be seen by the doctor.

Consulting/examination rooms

24. Although there will be only an occasional need for an E.N.T. patient to undress or be examined lying down, the rooms should be designed identically to those of the main out-patient department with a couch within a curtained area. Appendix 2 shows a suitable arrangement. This will enable them to be used at appropriate times for any other speciality. They should be planned on an external wall with natural light and ventilation but should be capable of being blacked out. About 6 doctor-sessions or 12 room-sessions per 100,000 of the population per week are likely to be required to handle the

caseload at the E.N.T. clinic - see paragraphs 55 and 187-190 of the Scottish Home and Health Department publication, Hospital Planning Note No 6: Organisation and Design of Out-patient Departments (HMSO, 1967: price 75p).

Treatment area

25. It is preferable that treatment be given within curtained cubicles each of which should be a minimum of 3.3 m wide x 2.7 m deep and contain a couch, lavatory basin, examination light, treatment trolley, doctor's stool and examination chair and equipped with piped medical vacuum. In addition, one cubicle should be equipped with an operating microscope mounted on a stand.

Preparation and recovery space

26. A screened area adjoining the treatment cubicles should be provided with reclining chairs for patients being prepared for further procedures or who need a period of recovery before leaving.

Clean utility

27. The suite should have its own room for the storage of all materials and instruments required for examination and treatment. It should be large enough for the setting up of treatment trolleys and should be readily accessible to both consulting/examination rooms and treatment cubicles. A bench-mounted sink provided with elbow-operated mixing taps will be needed for the dual functions of cleansing and hand washing. Because of the very large number of small instruments used - nasal and aural specula, tongue depressors, probes, forceps etc - central sterilization may not be practicable and it may be necessary to provide a local sterilizer of the type described in paragraph 65.

Dirty utility

28. A holding area should be provided for bagged items awaiting disposal. Used instruments would be washed here before being sterilized and a stainless steel sink with drainer will be required. Although its primary relationship will be with the clean utility, it will serve the whole unit and should be planned accordingly.

Labyrinth test room

29. Some of the tests for vestibular function (e.g. positional tests for otolith function and tests for opto-kinetic nystagmus) need no special accommodation and can be performed in the consulting room, but special accommodation is required for the most important test, the caloric test for semi-circular canal function. In this test the patient lies on a couch in a darkened room (100% blackout being required) with the back-rest of the couch raised to an angle of 30° to bring his horizontal semi-circular canals into the vertical plane and fixes his gaze on a light source on the ceiling. His ears are then perfused in turn for 30/40 seconds at a time, first with warm water at 44°C and then with cool water at 30°C from thermostatically controlled reservoirs and, exceptionally, with cold water at about 20°C from the mains. The convection currents thus set up in the endolymph of the semi-circular canals cause nystagmus; the eye movements are observed, sometimes with the aid of Fresnel lenses, and their frequency and duration are recorded manually, normally by the doctor.

30. However the use of an electro-nystagmograph in connection with the caloric test and also for the study of spontaneous nystagmus is gaining wide acceptance. The instrument provides a record of the nystagmus. An added advantage is the possibility that the testing of the patient can be carried out by a scientific officer or suitably trained technician, and the recorded trace made available for the doctor's later inspection thus relieving him of the need to conduct the test in person.

31. Appendix 3 shows a suitable layout of furniture, fixtures and equipment for both caloric testing and electro-nystagmography within a room of the same dimensions as a standard consulting/examination room. Since much of the testing is done under darkened conditions there is no need to site this room on an external wall with windows, providing that it is adequately ventilated and its design is such as to put patients at their ease. Since the technician needs a light to operate the equipment whilst the patient is required to be in almost total darkness, it must be possible to screen off the recording area from the rest of the room by a light-tight material.

AUDIOLOGY SUITE

32. For the diagnosis of deafness and the assessment of the degree of hearing loss in patients of all ages a suite of at least two sound-proofed audiology rooms is required, one of which should be specially designed for the testing of young children. The audiology suite should be planned with its own sub-waiting space and should be sited conveniently close not only to the E.N.T. clinic and to the hearing aid centre but, if possible, also to the out-patient elements of the children's comprehensive assessment unit.

33. Since the suite may be in continuous use and much of the testing prolonged and exacting, all its constituent parts must be efficiently ventilated and the ventilation system should be so designed that audiometry testing can be carried out without the need to switch off the supply of air in order to achieve the required level of quietness.

34. Should the nature of the structure needed for adequate acoustic isolation require a raised floor in any part of the suite, ramps to a maximum slope of 1 in 12 should be provided to enable wheelchair users to negotiate this change in level.

Children's audiology room

35. Children below the age of five years will seldom tolerate the wearing of headphones and must therefore be tested in "free field". This requires a large sound-proofed room in which the child can be seen by the doctor along with its parents. A room measuring at least 6.3m x 4.8m is required because the examiner needs to be able to move about the room producing test sounds of various kinds and intensities and observing the child's ability to hear and locate them. To avoid the potentially claustrophobic effects of the sound-proofing the room should have a window. It should be carpeted and its furnishing and decoration should be such as to set children at their ease. There should be ample cupboard space for play material used in the tests and also storage, possibly in a separate but adjoining room, for sound recording and other equipment. The reverberation time in the room should be between 0.2 and 0.25 seconds. If observation windows and windows to the outside are positioned in opposite faces of the room there is a chance of the production of low frequency standing waves. In such situations the observation window should not be parallel with the window in the external wall.

36. When not required for testing young children the room should be available for other purposes such as the testing of older children or adults, the fitting and testing of hearing aids or for lip-reading classes.

Observation lobby

37. The children's audiology room should be entered through an observation lobby separated from the outside corridor or the sub-waiting space and from the room itself by sound-proofed doors wide enough to admit a wheelchair. The purpose of the lobby is to allow the doctor and other observers to watch the reactions of shy or unco-operative children to various sound stimuli initiated from outside. It should be large enough to hold up to six people and it should be possible for the whole of the interior of the test room to be seen though a panel of dark glass. (A one-way mirror should not be used because it may enable the child to locate the source of manually produced test sounds by eye instead of by ear). If the lobby has an external window it should be capable of being screened when necessary to prevent those in the observation lobby being seen from the audiology room. The lobby will also be required to house recording apparatus which is not noiseless in action and it should have two-way audio-communication with the audiology room.

Adults' audiology room

38. At least one additional audiology room is required for the routine testing of older children and adults, usually by means of headphones. The tests must be conducted in very quiet conditions and it is necessary for the examiner and his equipment, which often generates noise, to be in a different acoustic environment from the patient. This is often best achieved by the use of a purpose-made prefabricated sound-proofed chamber (whose internal dimensions should be not less than 2.4m x 2.4m x 2.1m high) installed within a larger room, which is itself quiet and fitted with carpet and sound-absorbent wall and ceiling materials. The reverberation time in the room should be between 0.2 and 0.25 seconds.

39. The test equipment is kept in the test area outside the chamber and the technician who operates it is able to work under less exacting conditions than would be required if he had to be in the same room as the patient. He can move about and talk to other people, the doctor for example or student technicians, in ordinary tones without fear of disturbing the patient or interrupting the test. The doors to both spaces should be sound-proofed and should be wide enough to admit a wheelchair.

40. Where prefabricated chambers are used the dimensions quoted in paragraph 38 should be regarded as minimal in all new design projects. When the conversion of existing premises is involved internal dimensions of 1.2m x 1.0m x 2.0m high may be accepted as an absolute minimum and only if resulting in the more effective use of limited space.

HEARING AID CENTRE

41. Normally every district general hospital should have, in association with the E.N.T. clinic, a hearing aid centre whose functions will be:

(a) to prescribe suitable hearing aids for deaf patients, to fit them and to instruct patients in their use
(b) to assess progress by regular follow-up procedure
(c) to adjust, repair or replace hearing aids as necessary
(d) to act as an information centre about services for the deaf.

42. The hearing aid centre should adjoin the E.N.T. clinic and should be able to use all the latter's facilities as well as those of the audiology suite and the services of the speech therapist, lip-reading teacher and social workers.

Reception and waiting

43. These facilities and also patients' lavatories are shared with the E.N.T. clinic as described in paragraphs 18-21. In some instances it may be desirable to provide a small sub-waiting area immediately outside the interview/fitting rooms if these are too far removed from the main waiting area.

General office

44. This is where the records of patients attending the centre will be kept and where the general clerical and administrative work of the centre will be conducted. There should be space for a minimum of two clerks at desks with appropriate filing facilities and a cupboard for the temporary storage of incoming and outgoing hearing aids. The room should open from the reception area and should be naturally lit.

Interview fitting rooms

45. Two naturally lit rooms should be provided, with sound attenuation similar to that of the speech therapy room (see paragraph 48), where patients can be interviewed and their hearing aids fitted and tested. Impressions for ear moulds could also be taken here if wished.

Ear mould workroom

46. A room is required in which ear moulds can be made or finished. It should contain a sink and drainer, benching, equipment for taking impressions and making ear moulds, and cupboards for storing materials.

Workroom and store

47. A room is required where hearing aids can be adjusted and minor repairs carried out and in which hearing aids requiring major repairs can be packed for dispatch by post to the makers. It should open off a store room for hearing aids, spares, equipment and materials. The workroom should be large enough for one technician to work in at both a standing height worktop or sitting at a table and it should contain storage for tools and materials. If possible, there should be good access to both the general office and the ear mould workroom.

OFFICE AND OTHER SUPPORTING ACCOMMODATION

Speech therapy

48. A room of the size of a standard consulting/examination room will be required for the conduct of speech therapy sessions. It should contain a lavatory basin and cupboards for storing teaching materials. The room should be sited away from noisy areas but should be conveniently accessible both to the E.N.T. clinic and to the hearing aid centre. Sound-absorbing linings, including a carpeted floor, will be needed. Patients attending for speech therapy will use the primary E.N.T. waiting space and will be directed to the room by the receptionist.

Seminar room

49. At hospitals where in-patient treatment is given and the numbers of staff employed justify it, a seminar room should be provided for formal staff training. If the postgraduate training of junior medical staff is to be

undertaken part of the room should be equipped for the dissection of cadaveric temporal bones, using an operating microscope. Less formal training for small groups of staff can be given in one of the offices.

Offices

50. If not provided conveniently elsewhere offices will be required for:

(a) social worker

(b) unit charge nurse

(c) unit secretary

(d) one or more consultants.

Cleaners' room

51. Local cleaning policies and the location of cleaners' rooms in the adjacent main out-patient department will determine the need for such a room in the E.N.T. unit. If one is required it should be planned as those elsewhere, with sinks and space for storage and mechanical floor cleaning equipment.

Store

52. Whole hospital policies will determine the method of providing storage at departmental level but it is assumed that a lockable space or spaces will be required for items such as linen, disposables, stationery etc., in addition to that provided in cupboards within individual rooms.

Switch cupboard

53. A cupboard to house electrical distribution switchgear will be needed in a position selected to avoid cable lengths of more than about 30m from switchgear to furthest point served. It should be a minimum of 2.1m wide x 600mm deep with doors or removable panels giving access to their entire width and to a height of 2m. It should be sited in an area such as a corridor where its doors will remain unobstructed and preferably may open back fully during maintenance without themselves causing an obstruction.

Ventilation plant room

54. A special plant room serving the audiology suite will be required. It should be sited in such a position as to ensure that the noise produced by the equipment is not transmitted to the noise-sensitive rooms either through the structure or via the duct work. See also paragraph 60.

Lip-reading (Additional accommodation)

55. Instruction in lip-reading is an essential element in the management of deafness in the young adult and the older person and a sound attenuated room will be required for the lip-reading teacher. The purpose of the sound attenuation in this case is to contain the raised voice of the teacher giving instructions to the hard of hearing so that work in other areas is not disturbed. Instruction is given to individuals or small groups of up to 10 patients.

56. Assuming their respective work-loads permit, it should be possible for the speech therapist and the lip-reading teacher to use the same room, especially if other convenient rooms like the children's audiology room or the seminar room can be used occasionally for group instruction. Where sharing is not practicable a separate room should be provided for lip-reading.

V. Engineering services

GENERAL

57. The engineering services in the accommodation should follow general hospital practice. Guidance in other Building Notes, such as Hospital Building Note No 4: Ward Units (revised October 1968) should be followed.

58. Measurements circuits must be carefully segregated from mains services, as the output from an audiometer can be as low as a few micro-volts and break-through can easily arise. Equipment manufacturers' recommendations should be followed closely.

MECHANICAL SERVICES

Heating

59. Space heating requirements should be calculated on the following recommended design temperatures and ventilation rates, based on an outside temperature of minus 1°C:

Room/area	Temp (°C)	Air changes/hr
Treatment cubicles, labyrinth test room	21	6
Consulting/examination, recovery rooms	18	3
Observation lobby, adults' audiology	18	10
Young children's audiology	18	6
Interview/fitting rooms, ear mould workroom, workshop/store, speech therapy, seminar rooms	18	3
Reception, waiting, clean utility, offices	18	2
Lavatories, dirty utility, cleaners' room	16	2
Store, ventilation plant	10	½

Ventilation

60. Mechanical ventilation providing heating in winter and cooling in summer will always be necessary for the audiology rooms and the associated observation lobby, as they must be sealed because of the exacting standards of sound level required. The noise level in these rooms must not exceed 30dB(A) with the ventilation plant running or contain any predominant frequencies. A typical ⅓ octave frequency spectrum which meets these requirements is given in the table in Appendix 4. It should be noted that designing by octave levels, as is the case with NR/NC, may not meet the "no predominating frequency" condition. The possibility of conversations being overheard via the supply and extract ducts must be prevented. Particular care is therefore required in the selection, design, siting and installation of fan motors, fan, silencers, dampers, supply and exhaust air ducts and grilles for this area and it will usually be advisable to have a completely independent plant for this purpose.

61. Mechanical ventilation, possibly with summer cooling, may be required in any deep planned or core area. The plant and ducts for the core area ventilation should be separated from that required for the audiology rooms in order to minimise the total cost.

Piped services

62. The cold water service for the caloric test reservoirs in the labyrinth test room must be taken directly off the incoming water mains.

63. Hot and cold water pipe runs and drainage runs should be planned so as to minimise the risk of transmission of noises to the audiology and labyrinth test rooms, speech therapy and interview/fitting rooms.

64. Piped medical gases will not normally be required in this accommodation but piped medical vacuum should be provided in each treatment cubicle.

Sanitising equipment

65. If a steam sterilizer is required (see paragraph 27) it should be of the downward displacement type and should conform with B.S.3970, Part 3. A machine with a chamber 305 mm in diameter and 510 mm long will be adequate. It should be installed and maintained as indicated in Hospital Technical Memorandum No 10: Pressure Steam Sterilizers.

Caloric test reservoirs

66. These are usually thermally insulated, open top, stainless steel tanks from which up to 9 litres may be drawn before re-filling. Each tank has a control unit and pump, with a flexible tube terminating in a sterile plastic nozzle attached to the delivery side. Immersion heaters are fitted to the control units in two of the tanks, and these can be thermostatically controlled so that the water is maintained at $30^{\circ}C \pm 0.25^{\circ}C$ in one and at $44^{\circ}C \pm 0.25^{\circ}C$ in the other. The mains switch on the unit has a pilot light. An indicating thermometer is provided. The third tank is usually filled with cold water, the control unit for this tank has no heater or thermometer but has the pumping unit. The control unit can be removed so that the tank can be readily cleaned. All three tanks are filled with water direct from the cold water mains.

ELECTRICAL SERVICES

Lighting

67. Recommended values of illumination for the various rooms are as follows:

Room/area	Illuminance (Lux)
Consulting/examination, audiology rooms, observation lobby, treatment cubicles	200
Offices, interview/fitting rooms, ear mould workroom, speech therapy and seminar rooms, workshop/store, ventilation plant	150
Reception, waiting, clean utility, dirty utility, recovery, labyrinth test rooms	100
Lavatories, cleaners' room, store	70

68. Tungsten lighting is often preferred for the audiology rooms and the labyrinth test room since fluorescent lighting is liable to generate noise and cause electrical interference with the recording apparatus but this problem can often be eliminated by housing the chokes and starter switches away from these rooms. Fluorescent lighting imposes a lower load on the cooling equipment for a given illuminance.

69. Dimming facilities will be required for the general lighting in the consulting/examination rooms, the labyrinth test room and each treatment cubicle. This variation in lighting levels should preferably be obtained by switching off one or more lamps in each fitting. Dimming by transformer or resistor will be possible if filament lamps are used but dimming by thyristor and any form of dimming of fluorescent lamps may cause interference with sensitive recording apparatus.

70. The lighting in the children's audiology room must be designed so that no shadows are cast by persons or equipment moving in the room. Two ceiling-mounted spotlights are required in this room, one on either side of the patient's chair, for use as light stimuli. The position of the fittings and switches should be in accordance with the consultant's requirements.

71. Small fixation lights should be fitted on the ceiling above the couch in the caloric test area in the labyrinth test room. In the same area of ceiling there may be two other small lights for calibrating electro-nystagmography equipment should this be required. An examination

light must be provided and fixed so that it can be used to illuminate the patient's face when he is lying on the couch. A ceiling-mounted light which illuminates the wall and worktop behind the patient's head is the best form of general lighting for the labyrinth test room. The general arrangement of all these lights is shown in Appendix 3.

Power supplies

72. General purpose socket outlets should be provided on the following scales:

Room/area	Number of twin socket outlets required
Young children's audiology	6
Adults' audiology	5
Observation lobby, labyrinth test room	4
Reception, consulting/examination rooms, each treatment cubicle, recovery room, offices, ear mould workroom, workshop/ store, speech therapy and seminar rooms, ventilation plant	2
Clean utility, dirty utility, interview/fitting, cleaners' rooms	1

73. Socket outlets and switches in the children's audiology room should be at a height of not less than 1.4 m above floor level. The heaters for the water reservoirs in the caloric test areas should be connected to the power supply by means of switched socket outlets, particular attention being paid to the earthing.

Communication circuits

74. Communication circuits are required between the audiology rooms and their associated entrance/observation lobbies and should be in accordance with the consultant's requirements.

75. The microphones for the children's audiology room are usually suspended from the ceiling and the connection to them should be of the plug-and-socket type. The circuits should enable sounds from a record player or tape recorder to be reproduced from loud speakers in the audiology room and simultaneously, as required, in the associated observation lobby. Sounds picked up from the microphones in the audiology room should be reproducible in the observation lobby. A microphone in this observation area should be connectable to the loud speakers in the audiology room. Appropriate switches

should be provided to enable the children's consultant's communication system to be operated from his desk in the audiology room and/or from the observation lobby. Loud speakers should be of a high quality type. Microphones should be of the omni-directional type.

76. Microphones should be provided in the other audiology rooms so that patients can communicate by loud speaker to the consultant in the associated observation area. The control switches for these circuits should be in the observation area.

77. A length of 25 mm PVC conduit, with 150 mm boxes at each end should be provided between each audiology room and its associated entrance/observation area. The boxes should have insulated covers. Additional control and communication cables may later be drawn into the conduit to terminals or sockets on the box covers at each end as required by the consultant. The ends of the conduit should be sealed to prevent the transmission of noise along it.

Staff location system

78. The hospital staff location system should be extended to cover this accommodation.

Fire alarm

79. A small fire alarm bell or buzzer should be provided in each audiology room, the labyrinth test room, speech therapy room, lip-reading room (if provided separately) and interview/fitting rooms since the occupants may be unable to hear the general fire alarm because of the sound insulation provided for these rooms. A visual signal should be provided in addition to the audible signal and this should be clearly labelled FIRE ALARM.

Patient/nurse call system

80. A non-auditory (speech) patient/nurse call system should be installed. Normally call buttons will be required in patients' WCs. A reassurance light should indicate to the patient that the call has been made. An immediate visual or audible indication that a call has been made should be provided at the receptionist's point and should give responding staff an unambiguous identification of the source of the call.

81. A simple visual call system for the consulting rooms, audiology rooms and labyrinth test room may be required to call patients or staff who may be needed.

Telephones

82. Telephone systems for internal calls for the area will form part of the hospital telephone system and will normally be provided in the reception, consulting/examination rooms, audiology rooms, observation lobby, labyrinth test room, speech therapy room, each office and the workshop. Telephones should normally be of the desk pattern but wall pattern telephones may be appropriate in the labyrinth test room. The telephones in the audiology rooms and the labyrinth test room should be of the type having a lamp instead of a bell signal.

83. An acoustic hood with a GPO telephone for the use of patients should be sited in or adjacent to the main waiting space unless hospital public telephones are nearby. This telephone should be of the adjustable boost receiver type (GPO Hand Set No 4) and should be connected direct to the GPO exchange and not via the hospital exchange. It should be mounted at a height suitable for use by wheelchair patients.

Clocks

84. Electric clocks will normally be required in the main waiting area, treatment rooms and in each audiology room and the labyrinth test room. Clocks should have silent movements and in rooms where treatment is given and tests conducted they may have sweep second-hands. Clocks with 230 mm diameter dials should be adequate for most situations.

Caloric test recording equipment

85. An elapsed time indicator with a 120 mm diameter dial graduated 0 to 2 minutes with 2 seconds per division is required. This should be mounted on the wall at the head end of the couch and it may have a luminous dial or be otherwise dimly illuminated, with the light controlled by a separate switch. The commencement, stopping and re-setting of the timer will be effected by foot switches provided on either side of the head end of the couch and connected in parallel, so that for each observation the first operation of the switch shall start the timer, the second shall stop it and the third shall re-set it to zero ready for the next series of observations. A very quiet bell or buzzer should be connected to the

timer and arranged to give a single warning (a) after the elapse of 30/40 seconds (end of irrigation), (b) after the elapse of 60 seconds (onset of maximum response), (c) after the elapse of every 10 seconds thereafter (for comparison of frequency of response) until the timer is stopped. The timing equipment must also incorporate a switch that will close the starting circuit of the chart motor on the electro-nystagmograph (ENG) after a period of 35 seconds has elapsed and stop it simultaneously with the stopping of the timer. Standard equipment developed for this purpose is contained in two separate wall-mounted boxes, with an inter-connecting cable. Terminals within one of the boxes are provided for the following external connections:

(a) mains supply A.C. 240 volts 50 Hz single phase

(b) foot-operated switches.

The supply to the ENG chart motor is taken by means of a 3 pin 13 amp socket outlet mounted flush with the case.

Induction loop system

86. An audio induction loop system may be provided in the audiology suite, the hearing aid interview/fitting rooms and the speech therapy room. The loop cable is usually installed by the electrical services contractor and laid on routes recommended by the loop drive amplifier supplier. The amplifier supplier will connect and test the installation. The audio induction link cable should be laid so that it is nowhere within one metre of the staff call induction loop cable.

VI. Cost information

Cost control

87. For cost control purposes the lump sum Cost Guide figures for the various functional units shown in the Departmental Cost and Area Guide (Hospital Building Procedure Note No 6: part of CAPRICODE), will be applicable. These figures include basic accommodation together with circulation and an allowance in respect of additional accommodation and/or additional engineering.

88. Departmental guidance documents recommend the standards of accommodation and services for hospital departments which the Department of Health and

Social Security consider it reasonable to provide. Hospital Boards are at liberty to depart from the design recommendations given in such documents provided they are satisfied that the standards of accommodation and services they adopt are adequate. The Departmental Cost Allowance however is to be regarded as the maximum sum available for a department requiring the basic services specified in this Design Guide. Hospital Boards are encouraged to produce designs for the provision of appropriate accommodation and services at a cost less than the Departmental Cost Allowance.

89. The ear, nose and throat services Cost Guide figures provide for the basic accommodation detailed in paragraphs 17-54 and for the engineering services detailed in paragraphs 57-86.

Apportionment of costs

90. An assessment of the notional cost apportionment between the building and engineering service elements should be made at Procedural Stage C1 (Provisional Cost Plan - Hospital Building Procedure Note No 1: part of CAPRICODE)

Circulation space

91. For the purposes of preliminary planning the area occupied by internal circulation space and internal walls and partitions represents, on average, an addition of 40% of the net floor area of basic accommodation.

Plant rooms

92. The switchgear cupboard area shown in paragraph 53 is included in the basic accommodation; the plant room space required for ventilation plant is 15m^2 which is regarded as communication space. These areas have been calculated for a single department scheme and some reduction in the areas should be possible in a multi-department development.

Engineering services

93. The following engineering services are included in the quoted cost of basic accommodation shown in the Departmental Cost Guide:

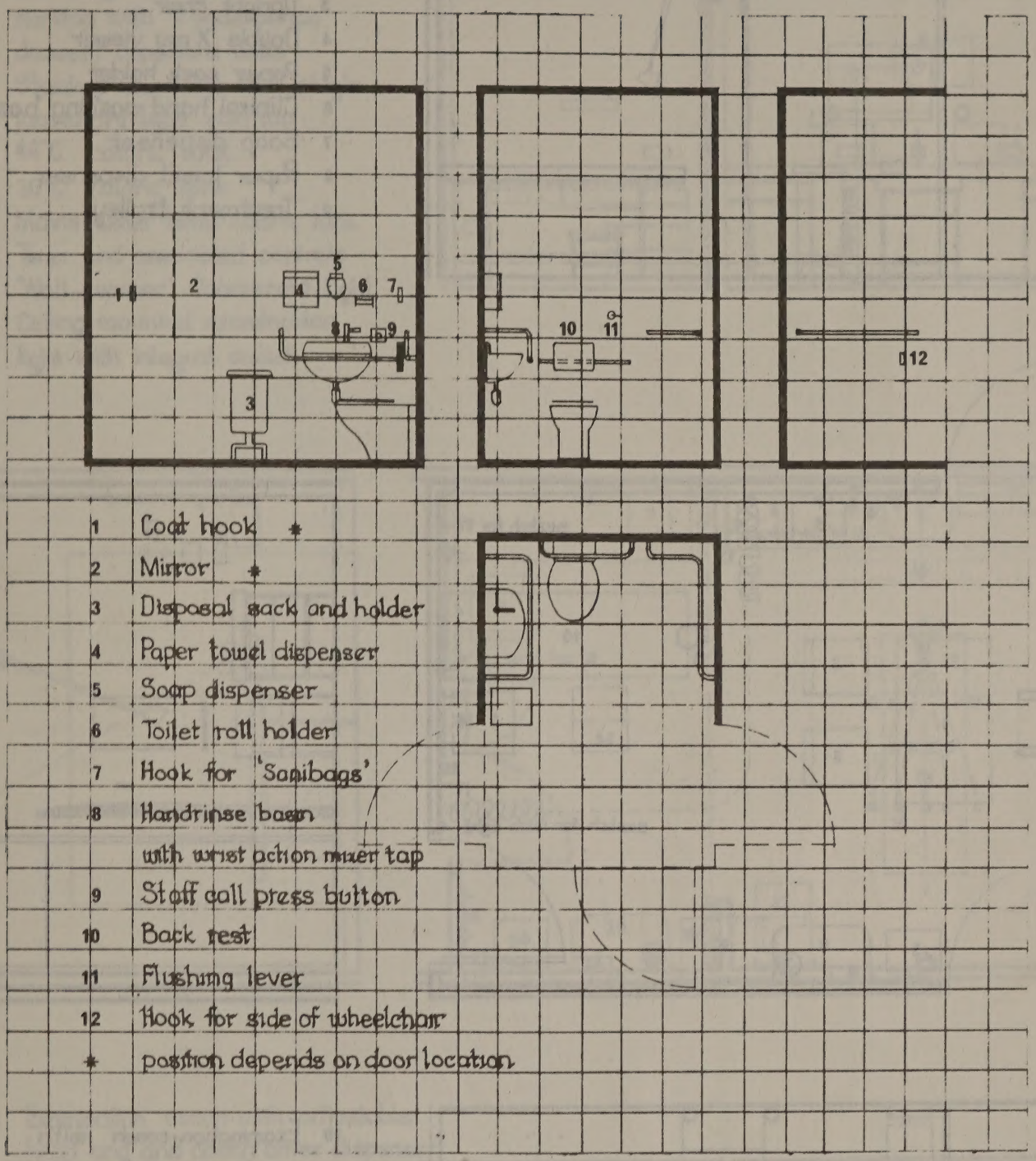
(a) Mechanical services:

Heating	- Low pressure hot water system with flush-fitting radiators from central supply.
Ventilation	- Extract from disposal rooms, plenum supply and extract from treatment rooms

Air conditioning	- To observation and audiology rooms.
Hot and cold water services	- From central supply. Not including calorifier or storage tanks.
Fire protection	- Supply from rising main to hose reel points.

(b) Electrical services:

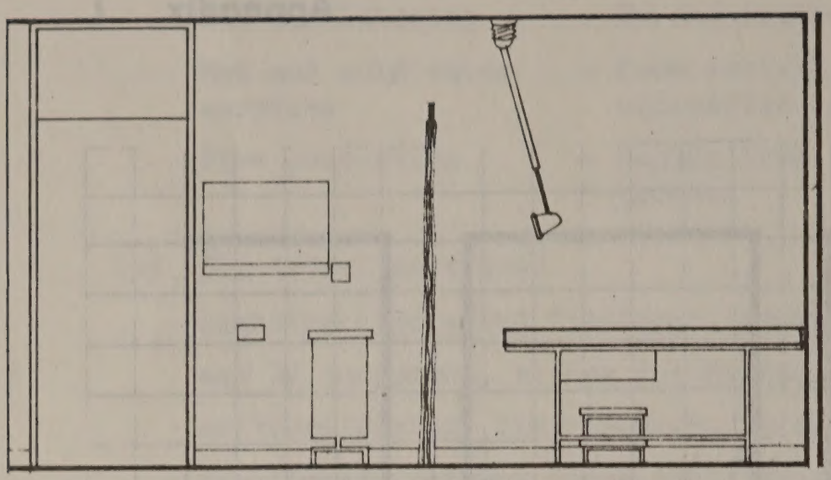
Lighting (including fittings), socket outlets, wiring for Group I and II equipment, wiring for mechanical services, clocks, standby services wiring, distribution, switchgear, sub-mains within the department, patient/nurse call, telephones, staff location system (including receivers) and fire alarms.


1 Coat hook *
2 Mirror *
3 Disposal sack and holder
4 Paper towel dispenser
5 Soap dispenser
6 Toilet roll holder
7 Hook for 'Sanibags'
8 Handrinse basin
with wrist action mixer tap
9 Staff call press button
10 Back rest
11 Flushing lever
12 Hook for side of wheelchair
* position depends on door location

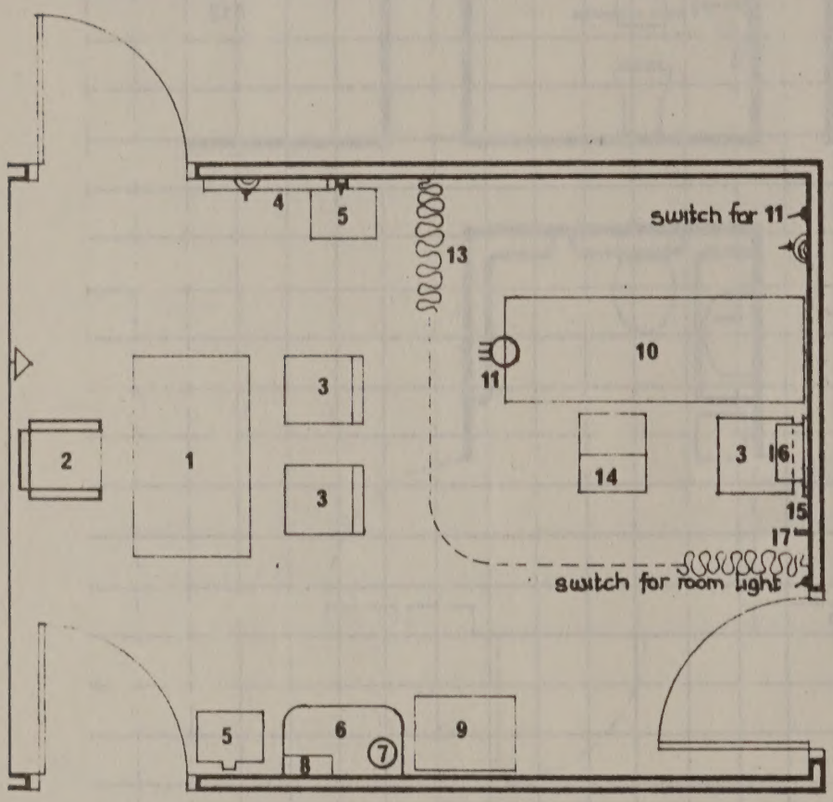
Wheelchair WC compartment

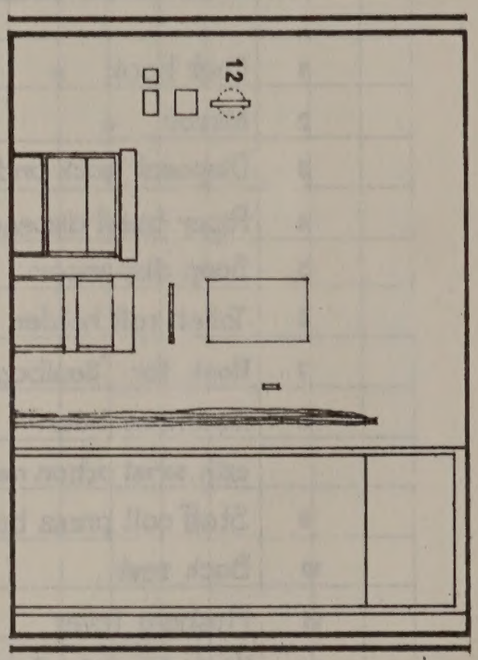
This sheet is derived from the library of activity data sheets being developed by DHSS. It indicates a layout suitable for handicapped patients including those in wheelchairs. Should it be planned in association with a urine testing room a small connecting hatchway will be needed in either of the two remaining positions shown where a door can occur. The grab rails and backrest shown have not yet been developed as standardised items which are in production.

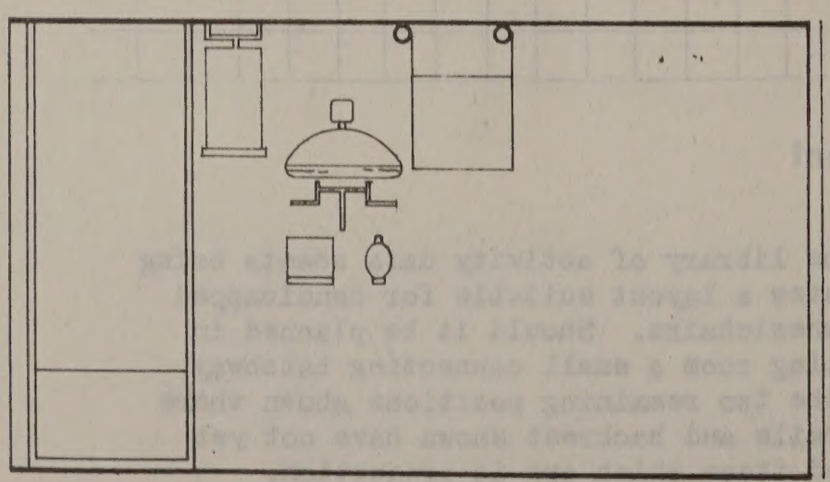
The layout may be handed.



1 Consultants desk
2 Consultants chair
3 Upright chair
4 Double X ray viewer
5 Paper sack holder
6 Clinical hand washing basin
7 Soap dispenser
8 Paper towel dispenser
9 Treatment trolley



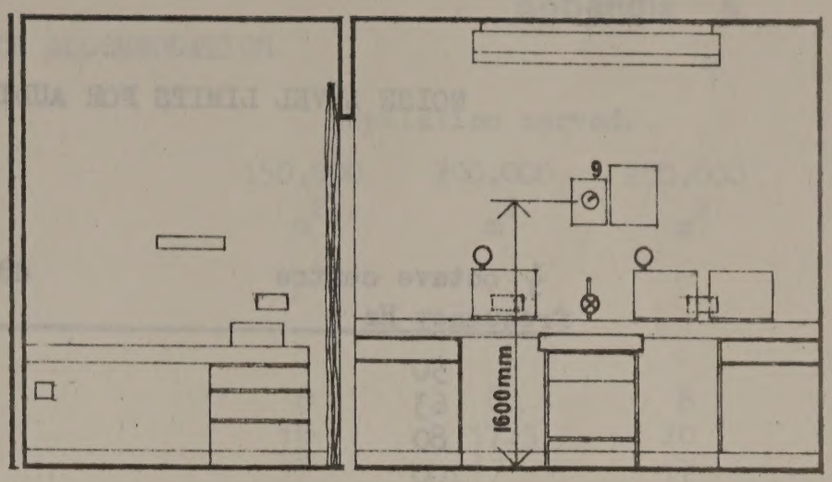


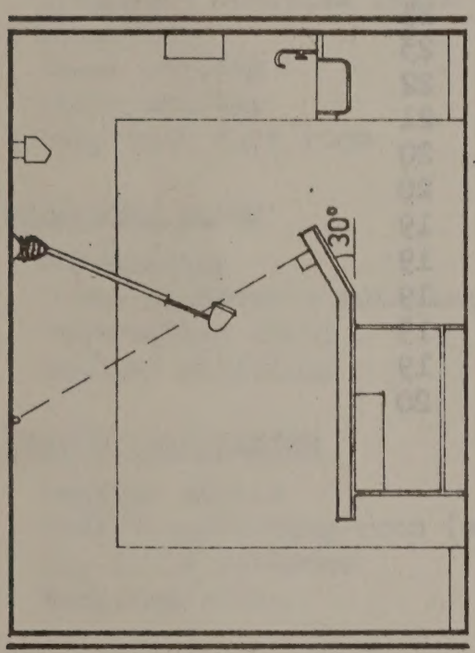


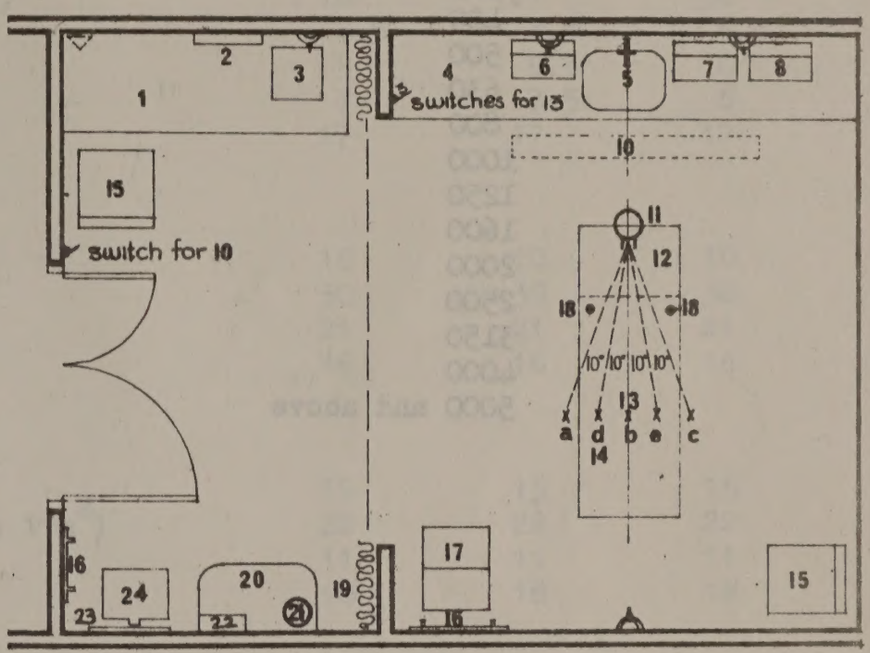
10 Examination-couch with couch cover dispenser
11 Ceiling mounted exam light
12 Sphygmamonometer wall-mounted
13 Cubicle curtain track & 2 curtains
14 Couch steps
15 Mirror
16 Shelf below 15
17 Coat hook

Consulting / examination room

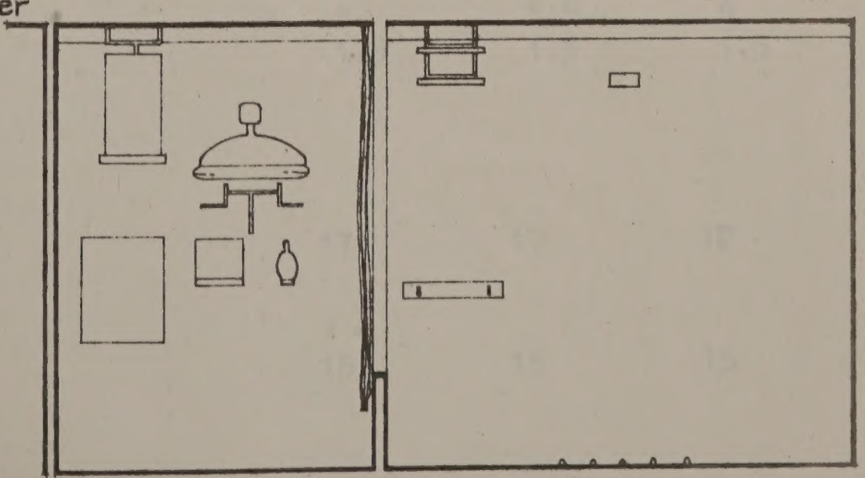
1 Desk with drawers
2 Wall light with integral switch
3 Electronystagmograph
4 Worktop with 2 underbench drawer/ cupboard units
5 Stainless steel sink with single laboratory-type cold tap
6 44°C caloric tank
7 30°C caloric tank
8 Mains water temp. caloric tank
9 Timer and associated controls
10 'Wall-washer' fluorescent light
11 Ceiling-mounted examination light with integral switch







12 Examination couch with adjustable head end and couch cover dispenser
13 Fixation lights (a, b, c,)
14 Calibration lights (d, e,)
15 Upright chair
16 Coat hooks
17 Couch steps
18 Foot controls for 9
19 light-tight curtains
20 Clinical handwashing basin
21 Soap dispenser
22 Paper towel dispenser
23 Mirror
24 Sack holder pedal-operated



Labyrinth test room

NOISE LEVEL LIMITS FOR AUDIOLOGY ROOMS

$\frac{1}{3}$ octave centre frequency Hz	dB SPL re 2 x 10^{-5} N/m^2
50	50
63	46
80	42
100	39
125	36
160	33
200	30
250	28
315	26
400	25
500	23
630	22
800	21
1000	20
1250	20
1600	19
2000	19
2500	19
3150	19
4000	19
5000 and above	20

Appendix 5

SCHEDULE OF ACCOMMODATION

	Population served: 150,000 m^2	200,000 m^2	250,000 m^2
A. BASIC ACCOMMODATION			
General			
Reception	8	8	8
Main waiting	15	17.5	20
Lavatories	17	17	17
ENT clinic			
Consulting/examination rooms (each 17m^2)	34	51	68
Sub-waiting	7.5	10	12.5
Treatment cubicles (each 9m^2)	18	27	36
Recovery	4.5	6.5	8.5
Clean utility	9	9.5	10
Dirty utility	7	7.5	8
Labyrinth test room	17	17	17
Audiology suite			
Sub-waiting	10	10	10
Young children's audiology	30	30	30
Observation lobby	21	21	21
Adults' audiology	16	16	16
Hearing aid centre			
General office	15	15	15
Interview/fitting room (each 11m^2)	22	22	22
Ear mould workroom	11	11	11
Workshop/store	18	18	18
Supporting accommodation			
Speech therapy	17	17	17
Offices (each 11m^2)	44	44	44
Seminar	20	20	20
Cleaners' room	5.5	5.5	5.5
Store	5	5.5	6
Switch cupboard	1.5	1.5	1.5
B. CIRCULATION (40%)			
C. ADDITIONAL ACCOMMODATION			
Lip-reading	17	17	17
D. COMMUNICATIONS			
Ventilation plant room	15	15	15